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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,075	07/08/2003	Randall M. Franklin	NM 7593	7908
66882	7590	02/23/2007	EXAMINER	
NEWMARKET SERVICES CORPORATION c/o JOHN H. THOMAS, P.C. 536 GRANITE AVENUE RICHMOND, VA 23226			MOSS, KERI A	
			ART UNIT	PAPER NUMBER
			1743	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)
	10/615,075	FRANKLIN ET AL.
	Examiner	Art Unit
	Keri A. Moss	1743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 12/4/2006.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-23 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-23 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____ .
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date _____ .	6) <input type="checkbox"/> Other: _____ .

DETAILED ACTION

1. Applicant's amendment and Declaration filed December 4, 2006 is hereby acknowledged. Claims 1-23 are pending.

Response to Amendment

2. Examiner acknowledges that applicant has used the trademark REFLECTOQUANT® properly within the specification.

Examiner has withdrawn the objection to claim 12 in light of applicant's amendments.

Examiner maintains the rejections under 35 USC 112, 1st paragraph.

Examiner maintains the rejection of claims 1-23 under 112 2nd paragraph.

The rejections under Zelaskowski and Dynasol have been maintained but have been altered slightly in light of applicant's arguments.

3. The Declaration of Dr. Joseph W. Roos under 37 CFR 1.132 filed December 4, 2006 is sufficient to overcome the rejection of claims 1-23 based on failure to comply with the written description requirement.

4. The Declaration of Dr. Joseph W. Roos under 37 CFR 1.132 filed December 4, 2006 is insufficient to overcome the rejection of claims 1-23 based upon Lack of Enablement or the rejection of claims 1-16 and 18-23 based upon Zelaskowski as set forth in the last Office action because: the specification is not enabling and the Zelaskowski reference does not read on the instant claims. Regarding enablement, Dr. Roos's arguments do not sufficiently address what Examiner considers the most

significant defects in the specification, specifically, the amount of direction provided by the inventor and the quantity of experimentation needed to make or use the invention based on the content of the disclosure. Since the reagents of the REFLECTOQUANT test are not disclosed in the specification, other than by a description of how they act in the test, one of ordinary skill in the art would not know how to replicate the test taught by applicants without undue experimentation.

Regarding the Zelaskowski reference, Dr. Roos argues that Zelaskowski is not a method for detecting the presence of a metallic species in a hydrocarbon matrix because the lead components are not in the hydrocarbon matrix when the detection takes place. This argument is not convincing because Zelaskowski does teach a method of determining the presence of lead in a hydrocarbon matrix. Whether the detection takes place while the lead is still in the hydrocarbon matrix is immaterial because Zelaskowski is determining whether lead was in the hydrocarbon matrix. Since the language of the instant claims' preamble is "comprising," the instant claims read on prior art that meets the claim elements, whether or not there are additional steps in the process.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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6. Claims 1-23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. As explained above, applicant has not disclosed one chemical that can be used as the colorimetric sensitizer chemical. Below, examiner discusses the lack of enablement within the context of the factors set forth in *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

First, Examiner notes that the definitions used during examination are exactly those used in the specification, specifically that the colorimetric detection material is any that contains a substance that is able to colorimetrically detect or facilitate detection of the presence of an organometallic complex or the metal thereof. The colorimetric sensitizer chemical is any substance that is able to colorimetrically detect or facilitate detection of the presence of an organometallic complex or the metal thereof. The organometallic compound is any that contains a metal and an organic molecule or compound. The organometallic complex is the result of the decomposition of the organometallic compound and the reaction of the organometallic compound with the colorimetric sensitizer chemical.

(A) The breadth of the claims. The claims are broad, including a method of detecting the presence of a metallic species (which includes more than 30 different claimed metallic elements) comprising reacting a colorimetric detection material containing an undisclosed colorimetric sensitizer chemical with an organometallic

compound in a hydrocarbon matrix with the resulting compound being an organometallic complex.

(B) The nature of the invention. The invention is a method for detecting the presence of a metallic species using a chemical sensitizer material and forming an organometallic complex.

(C) The state of the prior art. The term "colorimetric sensitizer chemical" is not a recognized term of art. A search for this term found only the instant application. The REFLECTOQUANT test contains a colorimetric detection material, but we do not know what chemical is the claimed "colorimetric sensitizer chemical." The exact chemicals used in this test remain a mystery to anyone except the holders of the trademark, who have no obligation to use the same chemicals in the test or to use chemicals that work in the same manner. Dynasol Elastomeros (EP 1 251 346 A1) discloses a sensor for determining organometallic compounds using an indicator dye that examiner guesses could be a possible equivalent to applicant's claimed "colorimetric sensitizer chemical" and includes a list of approximately 20 compounds. The metals can be from group 1, 2 or 13 of the periodic table. But one does not know whether the compounds act in the manner claimed by applicants.

(D) The level of one of ordinary skill. The prior art discloses dozens of compounds that contribute to the ability of a solution containing metal to change color.

(E) The level of predictability in the art. Chemical reactions are unpredictable by their very nature, therefore the art itself has unpredictability.

(F) The amount of direction provided by the inventor. The applicant gives no

guidance on what types of chemicals to use other than an instruction to use a compound that binds with the metal to be detected. This does not sufficiently enable one of ordinary skill in the art to make or use the claimed invention that changes color in the presence of a certain known metal and forms an organometallic complex.

Furthermore, without knowing the colorimetric sensitizer material, one would not know the organometallic complex formed when it binds with the metal and therefore would not know what complex to detect or how to detect it, i.e. what absorbance. Without knowing what to detect, one of ordinary skill in the art would not know whether the use of energy, acid or base is necessary for detection of the organometallic complex (see page 4 of the specification).

Applicant has only taught a reaction using the REFLECTOQUANT test kit but has not taught what chemicals are used in that kit. Without knowing the chemicals, one of ordinary skill in the art would not know whether their test acts like the detection materials of the instant claims. In that same vein, without knowing the chemicals, one would not know whether they are infringing the instant invention, if it were patented.

(G) The existence of working examples. There are no working examples of the colorimetric sensitizer chemical.

(H) The quantity of experimentation needed to make or use the invention based on the content of the disclosure. There is a necessity of a broad range of experimentation required to touch upon all the areas covered by the claims. One could not simply use any chemical that binds to any metal, for the invention to work, one

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needs a chemical that either changes color or results in a change of color when bound to only one metal.

Furthermore, without knowing the colorimetric sensitizer material, one would not know if an organometallic complex forms when it binds with the metal and therefore would not know what complex to detect or how to detect it, i.e. what absorbance. One would additionally need to test the reaction products to determine whether it is an organometallic complex. Without knowing what to detect, one of ordinary skill in the art would not know whether the use of energy, acid or base is necessary for detection of the organometallic complex (see page 4 of the specification). One would need to conduct further testing to find out whether the use of energy, acid or base is necessary.

Examiner believes the applicants have not provided sufficient information to reasonably apprise members of the public of whether they would be infringing the instant invention if it were patented.

7. Claims 1-23 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method for detecting the presence of manganese in a liquid hydrocarbon comprising contacting a liquid hydrocarbon containing manganese with a test strip containing the reagents of the REFLECTOQUANT® Manganese test kit, does not reasonably provide enablement for a method for detecting the presence of any metallic species in any hydrocarbon matrix comprising contacting any hydrocarbon matrix containing any organometallic compound with any colorimetric detection material comprising any colorimetric sensitizer chemical

able to react with the metal of the organometallic compound. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims. First, applicants have shown that the disclosed invention works only with manganese and manganese-comprising compounds and have not demonstrated it detects any metal. The name of the test, REFLECTOQUANT® Manganese test, is evidence to support the absence of evidence that the test is capable of detecting any other metal. Furthermore, Manganese is a highly reactive metal and applicants have provided no evidence that the REFLECTOQUANT® can detect a less reactive metal. Second, the colorimetric detection material and colorimetric sensitizer chemicals demonstrated to work in accordance with the invention are only the reagents of the REFLECTOQUANT® Manganese test kit. Applicant has not shown that any other chemical works in accordance with claim 1. Third, Applicant teaches that the invention works to detect manganese in hydrocarbon liquids but does not show how the invention works to detect manganese in gas or solid hydrocarbons. For example it does not appear that one could touch a REFLECTOQUANT® Manganese test kit test strip to the surface of coal and detect the presence of Manganese unless Manganese were on the surface of the coal. The above three points demonstrate that applicants have claimed an invention that is outside of the scope of what is enabled.

For purposes of examination, Examiner has interpreted the claims as broadly as they are claimed. For example, Examiner has searched for a) methods of detecting any organometallic compound, including an organolead compound, b) colorimetric detection

material including material containing a substance that changes color in the presence of a metal, c) detection of metal in gas, solid or liquid form.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. In claims 1-23, it is unclear whether the “organometallic compound” is MMT® or MMT® bound to ferrocene. If the “compound” is MMT® and ferrocene, it is also unclear whether MMT® forms a compound with ferrocene, the two compounds simply interact with each other or whether they interact at all.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Examiner is now trying to address all of applicants' remarks, which further clarified the invention for the Examiner.

13. Claims 1-16, 19-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Zelaskowski (USP 3,934,976). Zelaskowski discloses a method for detecting the

presence of a metallic species in a hydrocarbon matrix comprising contacting a hydrocarbon matrix containing an organometallic compound (column 2 lines 10-32) with a colorimetric detection material (iodine in an organic solvent) comprising a colorimetric sensitizer chemical (iodine) able to react with the metal of the organometallic compound causing a reaction between the metal from the organometallic compound and the colorimetric sensitizer chemical sufficient to form an organometallic complex (column 2 lines 39-40), and detecting the presence of the organometallic complex (abstract). The detection material is exposed to sufficient energy to at least partially liberate the metal of the organometallic compound from the compound onto or within the detection material (column 3 lines 22-42). The energy is in the form of heat, sonic radiation, a chemical reaction due to a chemical added, ultraviolet radiation, or sunlight (column 3 lines 22-42). The energy is of a wavelength and intensity (measured in joules/mole) absorbed by the organometallic compound sufficient to decompose said compound (column 3 lines 22-42). The hydrocarbon matrix is selected from the group consisting of gasolines, petroleum distillate fuels, kerosene, diesel fuel, biodiesel fuel, fuel oil, crude oil, refined oil, lubricants, engine oils, transmission fluids, hydraulic oils, aviation fuels, cutting fluids, and distillate bottoms (column 1 lines 12-27). The metal of the organometallic compound is lead (title). The presence of the organometallic complex is detected by a photometer (column 4 lines 13-35). The method further comprises the step of combining the detection material with an amount of dilute basic solution to the at least partially liberated metal of the organometallic compound (column 2 line 54-column 3 line 28). The method further

comprises the step of combining the basified metal with a dilute acid to oxidize the metal to an oxidation state able to react with the colorimetric sensitizer chemical (column 3 lines 43-60). The concentration of the organometallic compound in the hydrocarbon matrix is determined by translating the colorimetrically detected color intensity of the organometallic complex into a metal concentration value (column 4 lines 13-35). The method of claim 1, wherein the hydrocarbon matrix is selected from the group consisting of gasolines, diesel fuels, biodiesel fuels, fuel oil, industrial hydrocarbonaceous waste, and distillate fuels (column 1 lines 12-27).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1,148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of

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the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zelaskowski in view of Dynasol Elastomeros (EP 1 251 346 A1) (hereinafter Dynasol). See Zelaskowski, *supra*. Zelaskowski does not expressly disclose an organometallic compound or methyl cyclopentadienyl manganese tricarbonyl. Dynasol teaches a method of determining the presence of metals by binding an indicator dye to organometallic compounds such as organomagnesium or methyl cyclopentadienyl manganese tricarbonyl (paragraph 9). An advantage of the Dynasol method is that it provides a for a continuous, *in situ* and real time measurement of the reaction threshold. (paragraph 13). An additional advantage of Dynasol is that it teaches conducting the reaction on a polymeric support. It would have been obvious for one of ordinary skill in the art to combine the methods of Zelaskowski with those of Dynasol to gain the advantages of conducting the reaction on a polymeric support and to gain the additional advantages of providing a continuous, *in situ* and real time measurement system in order to simplify the method of Dynasol.

Response to Arguments

15. Applicant's arguments filed December 4, 2006 regarding the rejection on the basis of lack of enablement have been fully considered but they are not persuasive. The definition of the terms that were unclear were provided in the enablement rejection, paragraph number 5 subsection within the section titled The State of the Prior Art. The definition used by Examiner is also given in the 35 USC 102 rejection, pages 7-8 of the rejection. Since applicants have expressed that this definition was not sufficiently clear to applicants, Examiner has added a separate paragraph with the definitions.

16. Applicant's arguments regarding the Zelaskowski and Dynasol references, supra, filed December 4, 2006 have been fully considered but they are not persuasive. Applicants argue they cannot find in Zelaskowski where the metal and the colorimetric sensitizer chemical form an organometallic complex. Examiner points out the chemical reactions demonstrated in column 2 lines 38-39, which clearly point out a complex of diorganolead diiodide.

17. Applicant argues that Zelaskowski does not anticipate the instant application because the metal is not detected while within the hydrocarbon matrix. However, this argument is moot because the claims do not require the metal to be in the hydrocarbon matrix at the time of detection.

Conclusion

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keri A. Moss whose telephone number is 571-272-8267. The examiner can normally be reached on 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)272-1700. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Keri A. Moss
Examiner
Art Unit 1743

KAM 2/20/07



LYLE A. ALEXANDER
PRIMARY EXAMINER